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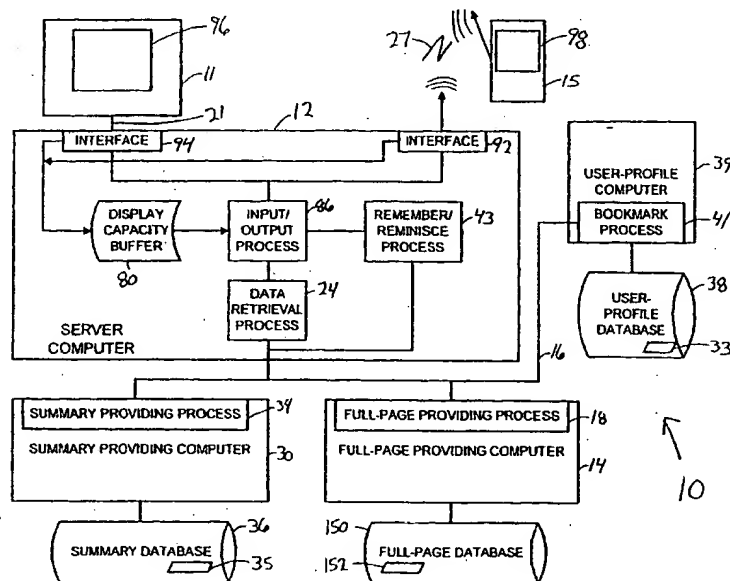
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(54) Title: INTERACTIVE MARKING AND RECALL OF A DOCUMENT



(57) Abstract: A method (10) for saving a location of a web page for later recall includes serving a first version (30) of the web page to a client (11 or 15); and in response to a client input, storing information identifying a location from which a second version (14) of the web page is available.

WO 02/059734 A1

WO 02/059734 A1



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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

## 5                    **INTERACTIVE MARKING AND RECALL OF A DOCUMENT**

### **FIELD OF INVENTION**

The invention relates to software associated with internet navigation, and in particular, to software for the marking and recall of documents or other information.

### **BACKGROUND**

10            Web pages are typically viewed using a personal computer system having a full-size computer monitor for displaying data. However, it has become increasingly common to use mobile, internet-enabled devices. Unfortunately, the mobility of such devices often comes at the expense of their displays. The display area on the displays such mobile devices, herein referred to as "miniature displays", can be much smaller than the full-size  
15            displays of a conventional computer systems.

          Some servers of web pages can determine that a client requesting data is a mobile device having a miniature display. When such a server determines that a client has a full-size display, it serves a full-page version of the web page. When the server determines that a client has a miniature display, it instead serves an summary page version of the web  
20            page.

          The summary page version of a web page is typically an abbreviated, or summarized version of the full page version. In many cases, the content of the summary page is so highly abbreviated that it becomes difficult to determine the content of the full-page that it purports to summarize. In those cases, a user may find it necessary to actually  
25            open the full-page version of the web page. A user who does so is then faced with enduring the tedium of scrolling through the full-page version of the web page using a miniature display.

          A user having little patience for scrolling through the full-page version with a miniature display will often wait until a full-size display is available. However, this  
30            requires that the user remember the URL of the desired page. One way to do this is to cut and paste the URL to a clipboard and save it as a file for later recall. This is a multi-step procedure that is often too much trouble. Another way to do this is to simply jot down the URL and type it into a browser window later on. However, the length of many URLs makes this approach error-prone.

## 5 SUMMARY

The invention enables a user viewing a web page on a first device to save the location of that web page and later recall that location using a second device. Whether the web page is viewed with the first or second device, an appropriate version of the web page is served to that device.

10 In one practice of the invention, a method for saving a location of a web page for later recall, the method includes serving a first version of the web page to a client; and in response to a client input, storing information identifying a location from which a second version of the web page is available.

15 In one aspect of the invention, serving a first version of the web page includes detecting hardware used by a client and requesting a first version of the web page, the first version having content consistent with the detected hardware. This first version of the web page is then served to the client. The first version can either be retrieved from a database or generated in real time by using the second version of the web page.

20 The first version of the web page can be a summary version of the web page designed for viewing on a miniature display and the second version of the web page can be a full-page version of the web page designed for viewing on a conventional display. However, in a broader sense, the invention is intended to include selecting a version of the web page from two or more available versions and to do so on the basis of characteristics of a requesting computer.

25 In another aspect of the invention, the detection of hardware used by the client includes the detection of the client's display capability. This can include, for example, determining that the display is a miniature display.

These and other features of the invention will be apparent from the following detailed description and the accompanying figures, in which:

## 30 DESCRIPTION OF DRAWINGS

FIG. 1 illustrates a system for carrying out the invention;

FIG. 2 illustrates a conventional display showing a full-page version of a web page and miniature displays showing full-page and summary versions of the

5 web page; and

FIG. 3 shows a reminisce window.

### DETAILED DESCRIPTION

FIG. 1 shows an example of a system 10 incorporating the invention. The illustrated system 10 includes a server 12 that communicates with clients, such as a desktop computer 11 and a hand-held computer 15, over a global computer network. The desktop computer 11 typically communicates with the server 12 over a land-line link 21. In contrast, the hand-held computer 15 typically communicates with the server over a wireless link 27.

The server 12 is also in communication with a full-page providing computer system 14 over an internet connection 16. The full-page providing computer system 14 maintains full-page versions of a web page. Examples of full-page providing computer systems include corporate information sites having web pages with links to other web pages within the site, search engine sites that dynamically generate web pages of links in response to user search queries, retailer sites containing pages of links leading to descriptions of articles for sale, and government sites containing pages of agency information or documents.

The desktop computer 11 includes a conventional display 96 sized to accommodate the full width of a typical web page. In contrast, the hand-held computer 15 typically includes a miniature display 98. The miniature display 98 is often so small that only a limited portion of a typical web-page can be displayed at any time. As a result, the user of a hand-held computer 15 must painstakingly scroll both horizontally and vertically to view a typical web-page.

To alleviate the tedium of scrolling through a typical web page using a miniature display 98, the server 12 includes an interface 92 configured to detect the display limitations of the hand-held computer 15 and to store information indicative of these limitations in a display-capacity buffer 80. On the basis of information in the display-capacity buffer 80, the server 12 selects between serving a full-page version of the web page and an abbreviated summary version of the web page. The summary version of the web page is sized to accommodate the miniature display 98 of the hand-held computer

5 15.

When the server 12 detects a request for a web page, an input/output process ("I/O process") 86 executing on the server 12 transmits the address of the requested web page, along with the display capacity information from the display-capacity buffer 80, to a data-retrieval process 24. If the display capacity information indicates that the requesting  
10 client has a conventional display, the data-retrieval process 24 issues a request to the full-page providing process 18. The full-page providing process 18 retrieves the full-page version 152 of the web page from a full-page database 150 and returns it to the data-retrieval process 24. The data-retrieval process 24 then transmits the full-page version 152 for output by the I/O process 86 to the requesting client.

15 On the other hand, if the display capacity information indicates that the requesting client has a miniature display 98, the data-retrieval process 24 issues a summary-page data request to a summary-providing process 34 executing on a summary-providing computer 30. The summary-providing process 34 retrieves a summary-page version 35 of the web page from a summary database 36. If no such summary-page version 35 is  
20 available, the summary-providing process 34 establishes communications with the full-page providing process 18 to retrieve the full-page version 152. Upon receipt of the full-page version 152, the summary-providing process 34 creates a summary-page version by summarizing the full-page version 152 to fit within the display capacity of the miniature display 98. In either case, the summary-page version 35 is then transmitted to the data-  
25 retrieval process 24 and then through the I/O process 86 for output to the requesting hand-held computer 15.

FIG. 2 shows a first window 26 displaying an exemplary full-page version 40 of a web page as seen on the conventional display 96 of FIG. 1. FIG. 2 also shows two  
30 smaller windows, a second window 27A and a third window 27B, as seen on the miniature display 98 of FIG. 1. The second window 27A displays the same full-page version 40 of the web page as the first window 26. The third window 27B displays an exemplary summary-page version of the web page.

While browsing with a hand-held computer 15, a user may encounter a summary-  
35 page version of a web page containing information of particular interest. Such a user may wish to view a full-page version of the same web page during a later browsing session on

5 a desktop computer 11 having a conventional display 96. To avoid having to jot down the address to the web page, the system creates and stores a virtual bookmark leading to the web page. In one embodiment of the invention, a user interacts with the window to cause the transmission, to the server 12, of a "remember" instruction, together with information identifying the web page.

10 Each window 26,27A,27B also includes a "Remember" button 70,70A that, when selected by a user, causes the address of the web page being displayed in the window 26,27A,27B to be transmitted to the I/O process 86 running on the server 12. The I/O process 86 then transmits the address information to a remember/reminisce process 43 that communicates with a virtual-bookmark process 41 on a user-profile computer 39. In  
15 response to an instruction from the I/O process, the virtual-bookmark process 41 stores the virtual bookmark 33 to be stored in a user-profile database 38 maintained on the user-profile computer 39. The virtual bookmark 33 typically includes the web page address, or URL, to enable retrieval of the web page, and a title to enable the user to easily recognize the web page on a list of available web pages.

20 The illustrated "Remember" button 70,70A is but one user-interface element for storing a link to a web page. In alternative embodiments, a user stores a link to a web page by choosing a menu command or, by uttering pre-defined words. The "remember" instruction can also be programmed to transmit additional information to the user-profile computer system 39. Such additional information can include, for example, information  
25 regarding the user. Such information can be used for marketing purposes or for finding additional pages of interest for the user.

At a subsequent browser session on a desktop computer 11 the user may want to retrieve stored bookmark information from the user-profile database 38. Referring again to FIG. 2, each window 26,27A,27B also includes a "Reminisce" button 74,74A that,  
30 when selected by the user, causes the remember/reminisce process 43 to transmit a bookmark request to the virtual-bookmark process 41. The virtual-bookmark process 41 then retrieves virtual bookmark 33 from the user-profile database 38 and assembles a reminisce page 76 that lists the titles of all web pages that the user has saved using the "Remember" button. Clicking on any title in the reminisce page causes an appropriate  
35 version of the corresponding web page to be loaded.

5           FIG. 3 shows a window 106 displaying an exemplary reminisce page 76. The  
reminisce page 76 displays a list of titles 108A-E representing previously remembered  
bookmarks 33. As indicated by the underlining, the titles 108A-108E lie within active  
regions. Each active region has a target site corresponding to the remembered web page.  
As a result, a user who views the reminisce window 76 can readily jump to one of the  
10           remembered web pages listed in the reminisce window 76 by clicking on its  
corresponding title.

Referring again to FIG. 2, the illustrated "Reminisce buttons" 74,74A are but one  
user-interface element for executing instructions for recalling remembered links to user-  
selected target documents. In alternative embodiments, a user can execute those  
15           instructions by choosing a menu command or by uttering pre-defined words.

As suggested by FIG. 1, the summary database 36, the user-profile database 38  
and the full-page database 150 are associated with computers 30, 39 and 14 that are  
remote from the client system 12. However, in an alternative embodiment, the summary  
database 36, the user-profile database 38 and the full-page database 150 can be  
20           maintained at the server 12.

Although FIG. 1 illustrates multiple computers 12,14,30,39 in communication  
over an internet connection 16, it will be understood that other connections between  
computer systems are within the scope of the invention. For example, the computers  
12,14,30,39 can be connected through a local area network.

25           The summary-providing computer system 30 includes software for maintaining a  
file structure for storage of summaries of large numbers of documents. These summaries  
can be created in a variety of ways. For example, human editors can be employed to  
create the summaries. Alternatively, summaries can be machine generated by a summary  
generation engine. The specific manner in which the summaries are generated is not  
30           important to the structure and operation of the invention.

By convention, the summary-providing computer system 30 maintains the  
summaries in directories that are named to correspond to the URL leading to the  
document being summarized. For example, a summary of the document found at

"ftp://www.mwdesign.co.uk"



5 would be kept in a directory named

"www.mwdesign.co.uk"

in a file structure accessible to the summary-providing computer system 30. This is advantageous since the summary-providing computer system 30 can then access the summary by simply stripping away the domain name prefixed to the summary URL  
10 already provided by the data-retrieval process 24.

One of ordinary skill in the art will recognize that other conventions for storing full-page data can be devised. The selection of such a convention is a mere implementation detail. Hence, a convention other than those specifically disclosed herein is within the scope of the present invention.

15 The summary pages presented can include interactive features in addition to those already described. For example, the summary pages may include a note-appending feature to allow a user to associate text of other objects with a particular summary. Or the summary page can include a facility for executing a customized user-defined script. Such a script may cause transmission of the full-page data to another application, for example  
20 by email.

A typical browser process provides for the display of a page, within a window, that includes "active" regions. The active regions are associated with instructions to be executed upon the occurrence of an event within an active region. By far the most common instructions provided on a typical page are instructions to jump to a specified  
25 location upon the occurrence of a mouse-click within the active region. Other events can also cause the execution of instructions. In particular, the entry of a mouse pointer into an active region, without a click of the mouse button, is an event that can be used to trigger the execution of instructions associated with that region.

30 The foregoing detailed description describes but one of many embodiments of the invention. It is therefore intended to be illustrative of the invention and not to be limiting in any way. For example, the description describes a system having a plurality of different computer systems interconnected by a global computer network such as the internet. However, it will be appreciated by one of ordinary skill in the art to which the invention pertains that the different computer systems can be integrated into a smaller

5 number of computer systems or into a single computer system. It will also be appreciated by one of ordinary skill in the art that the different computer systems can be interconnected by networks other than the internet. Although the description suggests that the different computer systems that participate in the implementation of the method of the invention are geographically dispersed, one of ordinary skill will recognize that this need  
10 not be the case. Two or more of these different computers can be located proximate to each other without departing from the scope of the invention.

The specific embodiment set forth above describes a system in which the output data is displayed as text and graphics on a computer systems monitor or output screen. However, this is not intended to preclude the use of other output systems. For example,  
15 depending on the nature of the output device, a computer system incorporating the invention can also provide audible output.

The specific embodiment set forth above describes a system in which user input is achieved by using a mouse or other pointing device connected to a computer. This is not meant to preclude the use of other mechanisms for providing input. For example, a user  
20 may provide input by speaking commands, using an eye-tracking device, or through a command line interface and keypad.

The specific embodiment set forth above illustrates several computers that are in communication with the system over several different communication connections. These connections can be, for instance, a telephone modem, a co-axial modem, an Ethernet device, or a wireless transmitter/receiver. It will be understood that other communication  
25 connections are within the scope of the invention.

The specific embodiment set forth above illustrates multiple interface devices on the system. Each interface device represents either a separate communication link or an individual port of a multi-ported communications device. Each interface device  
30 establishes two-way communication according to a suitable communications protocol, such as, telephone modulation/demodulation, digital subscriber line, Ethernet, BLUETOOTH(tm) or local area network. It will be understood that other interface devices and communication protocols to enable communication with any suitable input/output device are within the scope of the invention.

35 As used herein, the term "computer system" refers to a physical machine having

- 5 one or more processing elements and one or more storage elements in communication with the one or more of the processing elements. The term "process" refers to software that is being run on a computer system.

The foregoing description is thus an aid in determining the scope of the invention. It is not definitive of that scope. The limits of the invention are defined only by the  
10 appended claims.

The foregoing description presents an embodiment in which information is passed between a user and a computer system using conventional means such as a display monitor, a keyboard, and a pointing device, such as a mouse. However, this is not meant to preclude the use of other mechanisms for passage of information between a user and a  
15 computer system. Other mechanisms for delivering information from a user to a computer system include:

- (1) an audio interface that recognizes spoken commands;
- (2) an eye-tracking device that recognizes where a users eyes are pointing and  
20 processes this information to determine the information that a user wishes to communicate;

Other mechanisms for delivering information from a computer system to a user include:

- (1) a speech synthesizer that delivers information to a user by means of spoken words.

25 Certain terms used throughout this specification and claims, although originating in the context of conventional visual displays, are intended to include corresponding functions in the context of other types of information delivery. For example:

- (1) "Display" refers to the presentation of information, and includes, in addition to a visual display, a spoken recitation of information. Indeed, the Latin root of  
30 "display," which is "dispicare," means "to unfold" and carries no implication of visual, as opposed to audio, presentation of information.
- (2) "Window" refers to any set of information available for presentation to a user.

5           A "window" can include information displayed in a portion of a visual computer display. However, a window can also encompass the entire visual computer display. In the context of the audio delivery of information, a "window" refers to the set of information that can be spoken to the user upon the users request.

10           (3) "Formatting" refers to the enhancement of the information to be presented to the user. In the context of a video display, formatting has its conventional meaning in the art of changing fonts and layout of text and other objects, changing display colors, and similar functions. In the context of an audio display of information, formatting may include the manner in which words are  
15           spoken, for example volume, pitch, length of intervals between words, the setting of an option to read punctuation aloud, the accent to be used, and the like.

          In addition, the foregoing description and claims refer to the display of a document "summary." As used herein, "summary" is intended to include any information  
20           indicative of the content of the document. Such information can be derived from information within the document itself or from information gathered from outside the document.

          Although the invention has been described above in the context of one embodiment, this is but one of many embodiments that incorporate the principles of the  
25           invention. The foregoing description is illustrative the invention and is therefore not to be construed as limiting the scope of the invention. Rather, the scope of the invention is to be determined by the appended claims.

          Having described the invention, and a preferred embodiment thereof, what we claim as new, and secured by letters patent is:

5

## CLAIMS

1. A method for saving a location of a web page for later recall, the method comprising:
  - serving a first version of the web page to a client; and
  - in response to a client input, storing information identifying a location from  
10 which a second version of the web page is available.
2. The method of claim 1, wherein serving a first version of the web page comprises:
  - detecting hardware used by a client;
  - requesting a first version of the web page, the first version having content  
consistent with the detected hardware; and
  - 15 serving the first version of the web page to the client.
3. The method of claim 1, wherein storing information identifying a location from  
which a second version of the web page is available comprises:
  - providing a user-interface element for display on the client, the user-interface  
element being associated with instructions for saving information identifying  
20 a location of the web page
  - detecting a selection of the user-interface element.
4. The method of claim 1 wherein storing information identifying a location from  
which a second version of the web page is available comprises:
  - storing first information descriptive of the client;
  - 25 storing second information identifying a location from which a second version of  
the web page is available;
  - maintaining a link indicative of a relationship between the first and second  
information.

- 5     5.     The method of claim 1, further comprising selecting the first version to be a summary version of the web page.
6.     The method of claim 1, further comprising selecting the second version to be a full-page version of the web page.
- 10    7.     The method of claim 1, wherein detecting hardware used by the client comprises detecting a display capability of the client.
8.     The method of claim 7, wherein detecting the display capability comprises determining that the display is a miniature display.
9.     The method of claim 2, further comprising generating the first version of the web page.
- 15    10.    The method of claim 9, wherein generating the first version of the web page comprises:
- retrieving the second version of the web page; and
- processing the second version the web page to generate the first version of the web page.
- 20    11.    The method of claim 10, wherein processing the second version of the web page comprises summarizing the second version of the web page.
12.    A computer-readable medium having encoded thereon software for saving a location of a web page for later recall, the software comprising instructions for:
- serving a first version of the web page to a client; and
- 25    in response to a client input, storing information identifying a location from which a second version of the web page is available.
13.    The computer-readable medium of claim 12, wherein the instructions for serving a first version of the web page comprise instructions for:
- detecting hardware used by a client;

- 5            requesting a first version of the web page, the first version having content  
             consistent with the detected hardware; and
- serving the first version of the web page to the client.
13.        The computer-readable medium of claim 12, wherein the instructions for storing  
10        information identifying a location from which a second version of the web page is  
             available comprise instructions for:
- providing a user-interface element for display on the client, the user-interface  
             element being associated with instructions for saving information identifying  
             a location of the web page
- detecting a selection of the user-interface element.
- 15        14.        The computer-readable medium of claim 12 wherein the instructions for storing  
             information identifying a location from which a second version of the web page is  
             available comprise instructions for:
- storing first information descriptive of the client;
- storing second information identifying a location from which a second version of  
20        the web page is available;
- maintaining a link indicative of a relationship between the first and second  
             information.
15.        The computer-readable medium of claim 12, further comprising selecting the first  
             version to be a summary version of the web page.
- 25        16.        The computer-readable medium of claim 12, further comprising selecting the  
             second version to be a full-page version of the web page.
17.        The computer-readable medium of claim 12, wherein the instructions for  
             detecting hardware used by the client comprise instructions for detecting a display  
             capability of the client.
- 30        18.        The computer-readable medium of claim 17, wherein the instructions for

- 5           detecting the display capability comprise instructions for determining that the display is a miniature display.
19.   The computer-readable medium of claim 13, wherein the software further comprises instructions for generating the first version of the web page.
20.   The computer-readable medium of claim 19, wherein the instructions for  
10       generating the first version of the web page comprise instructions for:
- retrieving the second version of the web page; and
- processing the second version the web page to generate the first version of the web page.
21.   The computer-readable medium of claim 20, wherein the instructions for  
15       processing the second version of the web page comprise instructions for summarizing the second version of the web page.
22.   A method for saving a location of a full-page version of a web page, the method comprising:
- serving a summary-version of the web page;
- 20       in response to user-input, storing information identifying the location of the full-page version of the web page.



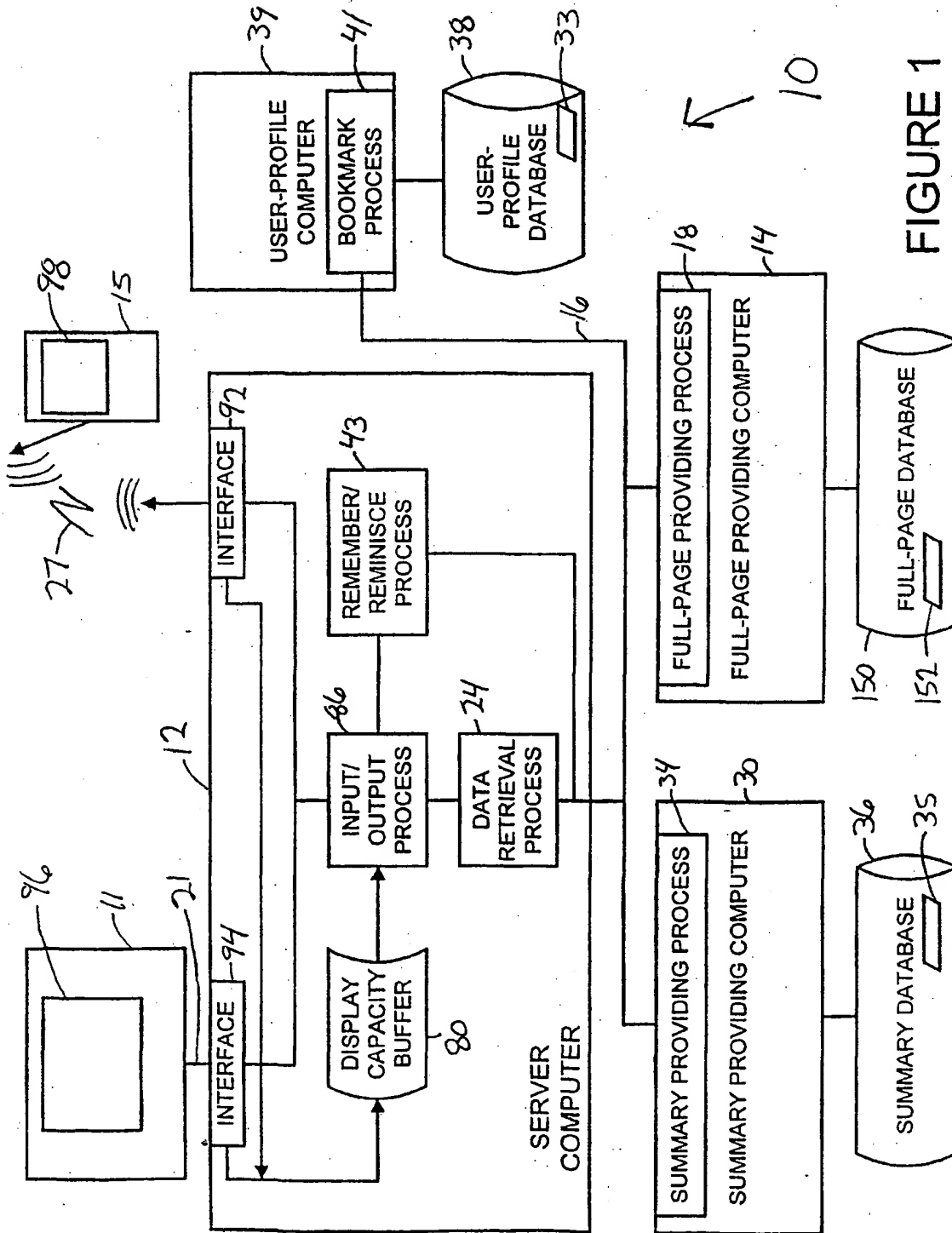


FIGURE 1

70 74

United States Patent 4,000,000 Mendenhall

4,000,000  
December 28, 1976

**Process for recycling asphalt-aggregate compositions**

Abstract

In recycled asphalt-aggregate compositions prepared by adding a suitable amount of make-up asphalt to pieces of the used composition and heating the mixture in a rotating cylindrical drum by tumbling the composition over heated pipes as it is gradually directed towards an output end of the drum, the improvement comprising adding an amount of petroleum hydrocarbon to achieve a laid down asphalt penetration of between 25 and 300 dnm at 77 degrees F. A further embodiment of the improved process comprises venting a mixture of hydrocarbon gases and moisture vaporized from the hot composition mixture at the output end of the apparatus, condensing the moisture and removing it and returning the hydrocarbon gases to a combustion chamber for providing heat to the apparatus tubes. Still another improvement comprises an apparatus modification wherein a plurality of relatively short pipes are disposed in the forward ends of the heating tubes through a front plate displaced from the forward end wall of the drum with the open pipe ends exposed to the combustion chamber for providing heat to the interior of the heating tubes.

Inventors: Mendenhall; Robert L. (1770 Industrial Road, Las Vegas, NV 89102)  
Appl. No.: 488518  
Filed: July 15, 1974

40 70A 74A

United States Patent 4,000,000 Mendenhall

4,000,000  
December 28, 1976

**Process for recycling asphalt-aggregate compositions**

Abstract

In recycled asphalt-aggregate compositions prepared by adding a suitable amount of make-up asphalt to pieces of the used composition and heating the mixture in a rotating cylindrical drum by tumbling the composition over heated pipes as it is gradually directed towards an output end of the drum, the improvement comprising adding an amount of petroleum hydrocarbon to achieve a laid down asphalt penetration of between 25 and 300 dnm at 77 degrees F. A further embodiment of the improved process comprises venting a mixture of hydrocarbon gases and moisture vaporized from the hot composition mixture at the output end of the apparatus, condensing the moisture and removing it and returning the hydrocarbon gases to a combustion chamber for providing heat to the apparatus tubes. Still another improvement comprises an apparatus modification wherein a plurality of relatively short pipes are disposed in the forward ends of the heating tubes through a front plate displaced from the forward end wall of the drum with the open pipe ends exposed to the combustion chamber for providing heat to the interior of the heating tubes.

27A

US PAT, 4,000,000. Process for Recycling Asphalt-Agg. Compositions: Recycled asphalt-agg comp's prepd by addg suitable amt of make-up asphalt to pcs of used comp + heating mix in rotating cyl drum by tumbling comp over heated pipes as gradually directed towards output end of drum, improvmtnt comprsg addg amt of petrolum hydroC to achieve laid dn asphalt penetration between 25 + 300 dnm at 77 deg F. Further embod. Of process comprises ventg mix of hydroC gases + moisture vaporzd from hot comp. Mix at output end

27B

41

FIG. 2

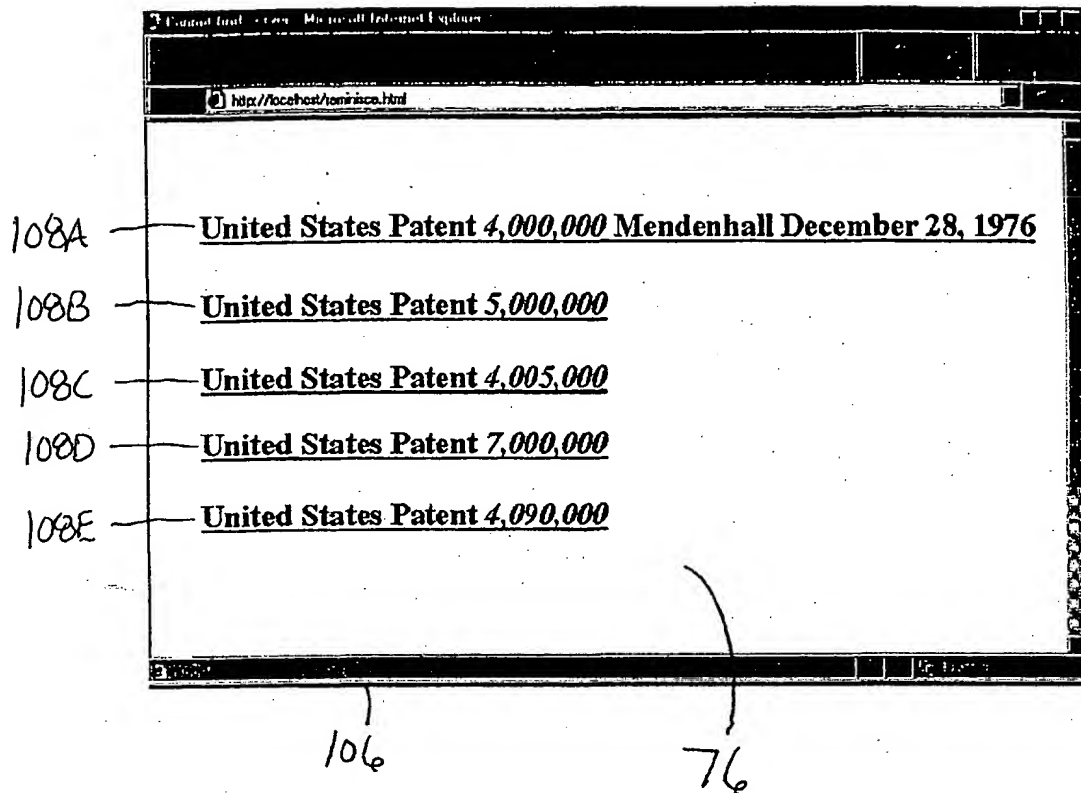


FIG. 3

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US02/01989

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :G06F 3/00, 19/00, 15/00, 17/00

US CL :Please See Extra Sheet.

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 709/217-219; 345/721, 737-747, 764-768, 774-778, 850-855; 707/1, 5, 501.1, 513-516, 524, 526

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
EAST 1.3 (USPAT; EPO; JPO; DERWENT; IBM\_TDB)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,572,643 A (JUDSON) 5 November 1996, Abstract, FIGs. 3-5, cols. 1-3, 5, 6 & 8.	1,3-6,9-12,14-17 & 20-23
X	US 6,133,916 A (BUKSZAR et al.) 17 October 2000, Abstract, FIGs. 1-6, cols. 2-9.	1,3-6,9-12,14-17 & 20-23
Y	US 5,054,055 A (HANLE et al.) 1 October 1991, col. 5, lines 28-39 & 44-47.	2,7,8,13,18 & 19
A	US 5,708,825 A (SOTOMAYOR) 13 January 1998, Abstract, FIGs. 3-8 & 10 and associated text, "summary page".	1,3-6,9-12,14-17 & 20-23
Y	US 5,943,679 A (NILES et al.) 24 August 1999, FIGs. 5 & 6 and associated text.	2,7,8,13,18 & 19

☐ Further documents are listed in the continuation of Box C.
 ☐ See patent family annex.

* Special categories of cited documents:	"I" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"A" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

20 MAY 2002

Date of mailing of the international search report

13 JUN 2002

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INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US02/01989

A. CLASSIFICATION OF SUBJECT MATTER:  
US CL :

709/217-219; 345/721, 737-747, 764-768, 774-778, 850-855; 707/1, 5, 501.1, 513-516, 524, 526

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